Using NVivo to Analyze Qualitative Classroom Data on Constructivist Learning Environments

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Abstract

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Keywords

Computer Based Qualitative Data Analysis, Qualitative Data Analysis, Computer Based Data Analysis, NVivo, and Constructivist Learning Environments

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This article describes how a qualitative data analysis package, NVivo, was used in a study of authentic and constructivist learning and teaching in the classroom. The paper starts with a summary of the research study in which NVivo was used to analyze the data and overviews the methodology that was adopted in this study. It, then, describes how NVivo was used in the analysis of observational (video) data, interviews and field notes. Key Words: Computer Based Qualitative Data Analysis, Qualitative Data Analysis, Computer Based Data Analysis, NVivo, and Constructivist Learning Environments.

Introduction

An earlier research study –a doctoral dissertation work (Ozkan, 2001) was conducted to have a better understanding on the characteristics of constructivist learning environments (CLE) and student responses to the CLE in which authentic activities and materials were used regularly. The concept of "family resemblance" by Wittgenstein (1953) has been used as a conceptual framework for understanding the nature of authenticity Eisner's (1998) connoisseurship model as data analysis strategy, and NVivo as the data analysis package. This paper specifically addresses how NVivo was used in this research study to analyze the qualitative data.

Using NVivo in Qualitative Data Analysis: Literature Review

After the rising of computer based qualitative analysis software (CQDAS) in the mid-1980's, qualitative data analysis became quite different. One of the leading packages on the market, NUD*IST, has established a great deal of popularity and recognition among the researchers in a short period of time. NVivo, the updated and improved version of NUD*IST, has provided many new opportunities for the scholars. However, there are only a few studies of the use of NVivo which reflect researchers' experiences in the analysis of classroom data. In this section, several studies and papers are referred to which are milestones in the use of NVivo in qualitative data analysis.

Anybody who wants to explore more about NVivo should refer to NVivo's creators, Lyn and Tom Richards's, books and articles. One of the most useful resources for the beginners produced by Tom Richards is "*An Intellectual History of NUD*IST and NVivo*". The theme behind this history is: "(1) Computing has enabled new, previously unavailable qualitative techniques;, (2) some important pre-computer techniques and methods were not supported by computerization of the field, at least until recently, and hence; and (3) computerization encouraged some biases in qualitative techniques" (Richards, 2002, p.199). In this paper, Richards (2002) also explains the rationale for designing NVivo in consideration of the reputation and long history of NUD*IST. NVivo does everything NUD*IST does and in

addition, it has character-based coding, rich text capabilities, edit-while-you-code, multimedia data, and splitting up the information load that nodes were being asked to carry.

Lyn Richards, the other developer of NVivo, points out an important feature of the program. She states (1999a, p.412) that NVivo "is designed for the researchers who wish to display and develop rich data in dynamic documents". The rich data she refers to is a wide range of data collected over a period of time. Needless to say, computer based programs served poorly in the previous years to deal with this kind of data. NVivo addresses this need with the features like rich text, memos, DataBites (media files such as video, audio, images, etc.), and new capabilities embedded into document and node browsers. Another outstanding resource produced by Richards (1999b) is *NVivo Reference Book,* which is the most detailed document in the field regarding nuts and bolts of using this software package.

Welsh (2002), in her paper, assesses the way in which NVivo can be used in data analysis. While the first part of the paper discusses different perspectives in computer-based analysis of qualitative data, the second part summarizes her research completed by using traditional paper and pencil method and NVivo. In this regard, she thinks that using qualitative data analysis software (QDAS) basically helps and assists researchers during labor-intensive process of qualitative data analysis. Not only are there many different approaches and debates on qualitative research methods and techniques, but also computer-assisted analysis of data was discussed widely. For instance, Seidel (cited in Welsh, 2002) expresses his concern that the software may "guide" researchers in a particular direction. There are also many other comments like "using QDAS may serve to distance the researcher from the data, encourage quantitative analysis of qualitative data, and create a homogeneity in methods across the social sciences" (Welsh, 2002). When it comes to NVivo many believe that it leads researchers to use "grounded theory" and its tools are designed to serve to this approach. Or, NVivo, having the best search option among other QDAS packages, is criticized as not being able to retrieve all the responses because it only takes into account the frequency of searched words but not meaning or synonyms.

There are also many supporting views for using computer programs in qualitative data analysis; for instance, it is not a requirement to follow grounded theory model while using NVivo or the major qualitative data analysis strategy of grounded theory, constant-comparative method. Some others believe that using computers in the qualitative analysis process may add rigor and prestige to research study, also to the believability and quality of the analysis. This is true if we think about how NVivo and other similar programs help organize and manage data files as well as support the representation of coding in a neat manner. However, it is still the researchers who will make the decisions for their data organization, coding, or analysis. Computer analysis programs do not add rigor per se, but the way researchers handle their data using these programs does add rigor.

In a study of using both manual and computer-based (NVivo) analysis techniques together, Welsh (2002, ¶9) discusses that "in order to achieve the best results it is important that researchers do not reify either electronic or manual methods and instead combine the best features of each". She (Welsh, 2002) thinks that if the data set is relatively small it would be possible to use only manual methods, although the researcher would risk human error in searching for simple information on the whole data set.

Asensio (2000) in another study describes the process and rationale of choosing QDAS to support a phenomenographic study of the students' experiences of networked learning in higher education in the U.K. As a group of researchers they investigate and contrast the three most well

known software packages, Atlas/ti, QSR NUD*IST, and QSR NUD*IST Vivo (NVivo) and explain why they have chosen NVivo in their research. This study is also very interesting in that it gives an example of phenomenographic analysis which is completely different from the grounded theory approach. Asensio (2000, ¶19) thinks that "the outcome of phenomenographic research is a set of categories of description which describe the *variation* in experiences of phenomena in ways that they were allowed to deepen their understanding on students' learning".

The aforementioned study aims at understanding the students' experiences of participating in a networked learning course. The basis of the study is phenomenological and draws on individual interviews of 60 students plus observations of the face-to-face classes and online environments. The study is also complemented by a survey of 300 students and mapping exercise for wide range of teaching staff to show the examples of the use of networked learning in higher education in the UK.

The existence of large and varied amounts of data and a research team geographically distributed require using a software program to support the management of the data. After using NVivo the research team agreed that the software increased their speed and flexibility in coding, retrieving, and linking the data. They also discuss that this new version of NUD*IST is really advanced and flexible as compared to other versions. One of the advanced features of NVivo is enabling researchers to work collaboratively on the same project from different geographic regions of the U.K (Asensio, 2000).

Di Gregorio (2000) in her interesting paper discusses how to use NVivo for literature reviews which are often overlooked as a form of qualitative analysis. She acknowledges the benefits of bibliographical software such as EndNote, Reference Manager, ProCite, and their unique biographical tools. However these packages do not support the analysis processes of literature review. "Of all the qualitative analysis software packages, only NVivo has a particular set of tools that is ideal for analyzing literature" (Di Gregorio, 2000). She uses "proxy documents" (documents created in NVivo) to summarize the particular authors' argument or quotation which may be retrieved later. "Memos" attached to proxy documents can be used to write reflections on a particular paper and then use these first reflections to build one's critique. "Document" and "node links" of NVivo may be used as reference to other works. Di Gregorio (2000, ¶3) also suggests the use of "attributes" and "sets" as organizers of the existent documents since these are also useful for restricted searches to particular documents by author, date, or discipline. She also presents some other strategies for the researchers to use in elaborating their literature review.

Rich and Patashnick (2002), in their study which investigates health conditions from the patient's perspective use the Video Intervention/Prevention Assessment (VIA) method as a research framework. Their research team "loans the participant a small, easy–to-use consumer camcorder and asks her/him to create a personal "video diary" of living with her/his medical condition" (p.247). Therefore, VIA "examines the illness experience from the outside in" (p.249). Rich and Patashnick (2002) try to adopt constructivist theory in their study as well by asking patients to interview their family members or friends to capture the whole picture of their condition (multiple perspectives and holistic approach). Also, they believe that social realities can be represented best by using a variety of media such as words, sounds, and images through VIA. In the analysis of their data, they found NVivo as the software package that responds best to the nature of VIA data. According to them, data can be coded easily in NVivo and the software supports analysis of different types of data. They also think that NVivo is ideal in "parallel analysis of visual and audio components, objective and subjective information, or any

of a variety of types of information that can exist simultaneously in video data" (Rich & Patashnick, 2002, p.251).

Purpose of the Study

There is a general lack of writing in qualitative research that sheds light on the "nuts and bolts" of the qualitative data analysis. Anfara, Brown, and Mangione (2002) argue for "the accountability of the researcher in documenting the actions associated with establishing internal validity (triangulation), theme development, and the relationship between research questions and data sources" (p.33). According to these authors, qualitative researchers should increase the opportunities in their writing for criticism and public inspection. Dickie (2003) suggests a different approach in qualitative research reporting and calls for less jargon and more detailed description within the data analysis process.

As seen in the previous section, there are only a few studies which exemplify how a qualitative software package can be used in the analysis of qualitative classroom data. In order to address a more open approach to reporting and to help researchers better understand how NVivo is used in an actual classroom study, the author will share her perspective on how it was done in one dissertation study. In the following sections, the research study will be summarized to give background for this article and then how and why NVivo was chosen for the data analysis will be explained. Finally, the researcher will share her experiences with the readers by explaining step by step the use of NVivo software.

The Study in which NVivo was Used

In recent years constructivism and its implications for instruction have been researched widely since it was seen as one of the best ways of renewing and restructuring learning environments. However, it is difficult to summarize and categorize constructivist implications since learning and teaching activities are less fixed, more fluid, and more complex. Authentic learning is, for instance, one good way to ensure constructivism in the learning environments Therefore, it is described, defended, and advocated in the literature. After reviewing the literature in authentic learning, one of the major implications is that authentic learning has to be used more often during the instruction. What is missing, however, is knowledge about what successful teachers who use CLE, especially authentic learning, do in the classroom and how students behave in such contexts. The research was conducted to address these questions.

Research Method and Data Types that were Used in the Study

The study used qualitative, case study methodology. One way to summarize the research methodology is to describe it as an effort to develop a rich, thick description of the cases, with data drawn from different sources. Qualitative methodology is considered to be the best methodology for this study, because it meets the descriptive nature of the research problems and gives the best picture of the learning environment studied. Eisner (1998, p.21) states that "qualitative experience depends on qualitative forms of inquiry. We learn to see, hear, and feel." Because this study is about the qualities of learning environments being studied qualitative inquiry best fits in this framework.

Data was gathered in several ways including classroom observations, informal and formal interviews of students and teachers, field notes, work completed by students including projects, student self assessments, reflective journal logs, teacher's comments and notes, and checklists. The different data sources used in this study are:

Interviews and Observations: Information about students' responses to CLE was gathered through interviews and observations. Student interviews were conducted at the conclusion of school visitations and also teacher opinions' about the constructivist-learning environment were gathered through in-depth interviewing. Teachers were interviewed during the first two weeks of the school visitations. In the last week, a second interview was conducted with each teacher. This last interview focused specifically on the use of authentic materials and activities. Finally, in addition to these formal interviews, informal questions were asked of teachers and students during observations in the classrooms as well as videotaping them working on the learning tasks.

*Field Notes***:** After each classroom observation field notes were written to clarify what was observed in the classrooms. Researchers' observations in the classrooms might be considered an example of non-participatory observation. However, while trying to be as unobtrusive as possible, the researcher did participate in some activities with teachers and students.

Student Products/Artifacts: A sample of student products (reflective journals, concrete products such as computer print-outs, pictures, and self or peer evaluation rubrics) were collected and used in the data analysis.

As for the data analysis approach, the interpretivist research paradigm was used as the epistemological framework of the study and the "Connoisseurship Model" of Eisner (1998) was used to guide the data analysis. This holistic approach of data analysis and a strategy that could be termed "reflective-interpretive" fits well with the use of NVivo. The software package does not force the use of certain data analysis strategies, but provides various tools for the researchers which they can choose from based on their research goals and ways of approaching their data.

The Data Analysis Software: NVivo

The data were analyzed using a qualitative data analysis program, QSR NUD*IST (Non-numerical Unstructured Data Indexing Searching and Theorizing) Vivo 1.2., also called NVivo which was launched in May 1999 (the screenshots used in this paper are from version 1.2. Now, NVivo has an updated version of 2.0). The researcher analyzed several other software packages as well, such as Atlas-ti, Ethnograph, and WinMax, before the data analysis took place, and NVivo was chosen as best fit for the study as well for the researcher's ease of use of the program. More specifically, these reasons are:

The structural design of the software. One who sees NVivo's main menu for the first time may think that this is a very easy program to deal with. This was the researchers' first impression, too. (At this point, it would be useful to mention that the researcher is a scholar in the field of instructional technology).

However, after the first impression fades away, some of the terms used in the NVivo, and/or sophistication level creates a learning curve. In fact, this is the case in most of the other qualitative data analysis software reviewed. It takes some time to understand some basic concepts like links, nodes, memos, and attributes, to get acquainted with the terminology, and learn how to use some important functions like coding, searching, or developing a model using graphic features of the software. However, once the basic features are understood, the process of

analyzing large amounts of qualitative data becomes much easier and more powerful than manual approaches.

The nature of the research study. NVivo is a powerful way to do sophisticated data coding and it supports several ways to build theories, either local or more general. These capabilities fit well with this study's research goals and the approach to data analysis. NVivo also enabled the researcher to look at coded segments of the data in context so that it was possible to explore coded passages without separating them from the material before and after. NVivo was also very helpful in easily organizing different data types and sources used in the study.

Ease of Searching for Relationships. It was also very useful to look at the data emphasizing the relationships within it. Using NVivo, it was easy to do cross-case analyses, to re-order the codes and add memos about potential relationships to files, and to "play" with the data. The advanced features of NVivo helped to develop concepts and do complex thinking about the data. The sophisticated search option of NVivo, for example, allowed the researcher to explore complex ideas or hypotheses quickly and easily.

Time Saved. NVivo helped to automate and speed up many data management and analysis tasks. To some researchers, this might be the most important feature of any computer program. Most QDA programs provide tools to organize data, help shape the data in ways researchers reflect upon it, and give opportunities to see data from different angles; and all these happen in seconds.

Rigor. Overall, NVivo was very helpful while building a rigorous database for the data analyzed. It demonstrated very clearly all the data coded and the way it had been coded. The relationships explored by the researcher among the data sources could be seen easily in the two browsers of NVivo. Also, the management of these long data files was very easy using NVivo. These were also the things that helped increase the rigor of the entire data analysis process. Welsh (2002) emphasizes another important feature of NVivo in terms of its adding rigor to the qualitative studies; search facility that enables researchers to interrogate their data. "However, the software is less useful in terms of addressing issues of validity and reliability in the thematic ideas that emerge during the data analysis process" (Welsh, 2002, ¶12). Therefore, it can be said that the NVivo package provided a tremendous help in the data analysis process and some facilities of the software helped increase rigor in terms of data management but it did not guarantee the validity of the study. The researcher used the term "believability of the data and conclusions" instead "validity and reliability" since these were not believed to be appropriate terms for qualitative research studies. The things that ensured the believability of the conclusions in this research study such as triangulation of data sources, extended experience in the environment, and researcher journaling had nothing to do with NVivo software but the way this study was conducted by the researcher.

Analysis of Constructivist Data Using NVivo

The research questions that guided the inquiry are as following:
In the elementary level classrooms studied:

> 1. What are the "family characteristics" of constructivist learning environments in which authentic materials and activities are using regularly?

2. What are the students' responses, in terms of their social (interaction with other students and interaction with the teacher), cognitive, emotional/affective, and other learning behaviors –to these kinds of activities and materials?

NVivo Basics

NVivo has two main menus: Document browser and Node browser. Figure 1 shows document browser.

Figure 1. Document Browser.
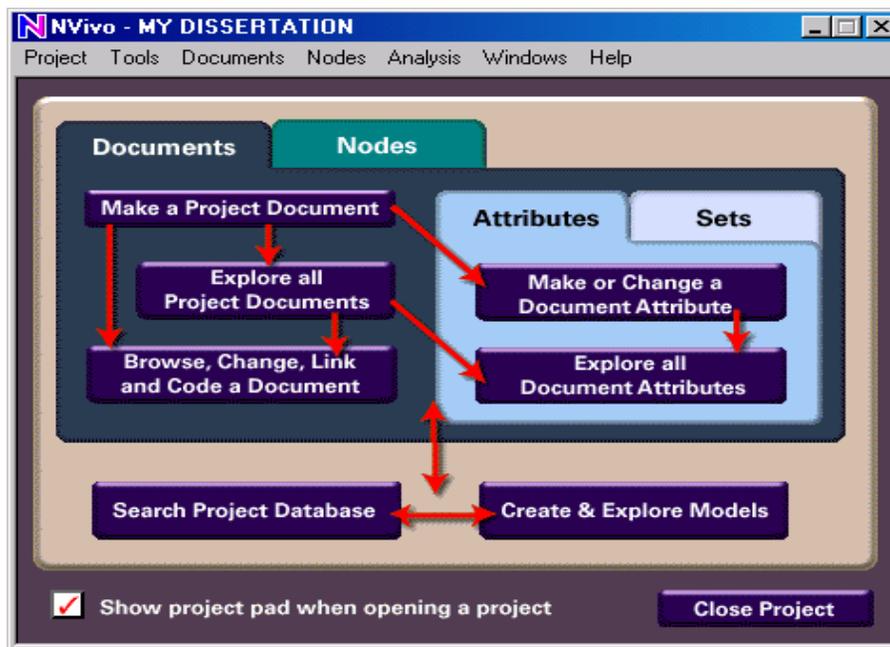
Document browser is the place where one can create, edit, view, manage, and explore project documents. Using NVivo it is possible to create and work with different kinds of documents as much as is needed. For example, documents can be created or imported from a computer hard disk into NVivo (internal documents) or files on the computer hard disk can be used as proxy documents (external documents). The proxy documents might be useful as reference documents and can be accessible through NVivo. One important thing to remember regarding documents is to convert them into rich text or plain text format in order to work with them in NVivo. Another type of the document is "memos" which is extended notes about the data. All kind of documents can be coded in NVivo including memos. In the document browser all the documents can be viewed in a database with short descriptions of each document, the time it was created or modified, and how many other documents are linked to each document.

The second menu in Figure 2 is "Node Browser", which represents categories throughout data.

Figure 2. Node Browser.
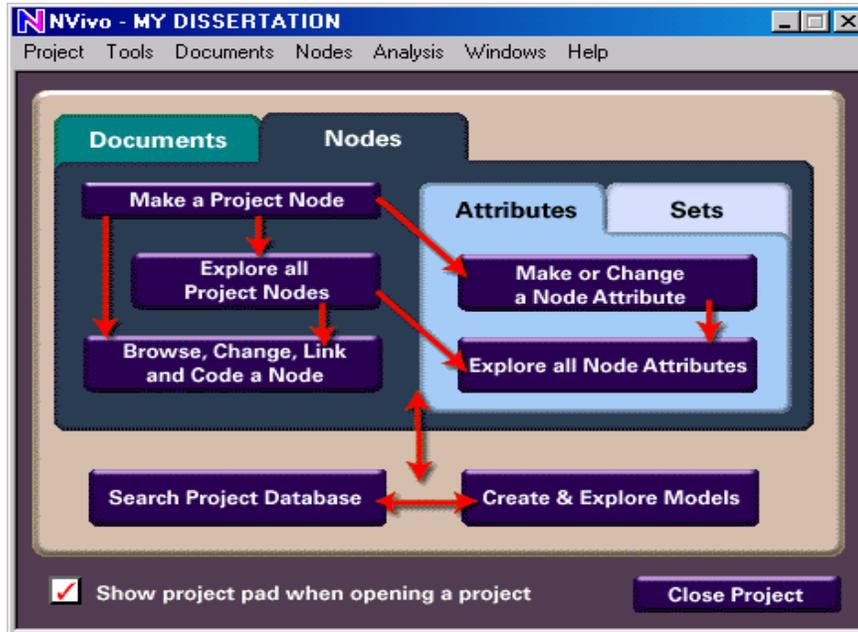
In other words, a node is coded data related to the study (Some QDA packages such as NVivo have their own terminology). In NVivo there are three options to code data: free nodes (coded but not categorized nodes), tree codes (codes in a hierarchical mode), and case nodes (codes categorized under different cases). The node browser looks very similar to the document browser and in fact, all the functions of document browser have equivalents in the node browser. However, the major difference between these two browsers is that in the node browser it is not possible to view texts but only references to documents.

Both document and node browsers have an *attribute* feature, which help researchers when referring some characteristics of data such as age, gender, etc. and also when quantifying data if needed. In this study this feature of NVivo was not used because of the nature of the data obtained in the classrooms.

Using NVivo, it is also possible to *search* the documents or nodes in the project. In fact, NVivo has a very sophisticated search tool which might be very useful while working with a group of researchers or while dealing with very large data files. A sophisticated search tool in QDAs is also a must while using content analysis or linguistic analysis. However, none of these reasons were the case in this study and the search feature was not used extensively.

Another important function of NVivo is using *sets*, a function in NVivo which groups documents in order to see the relationships among themselves and creates the *models* based upon it. Sets can also be seen as the first step of visualizing qualitative data. The second step is to utilize the *models* feature and draw visuals based on the patterns, data sets, or any other relationship researchers wish to see based on their data. Today, there are some very inexpensive

computer programs available as well, such as Inspiration to create webs of images, texts, or data to represent data visually.

Using NVivo in the Analysis of Different Data Sources

Interviews and field notes

The transcribed interview data and field notes were transferred into electronic formats in the early stages of the study (In fact, all the data were already stored in researcher's computer as Microsoft Word documents before this transfer). They were only converted from word format (.doc extension) into rich text file format (.rtf extensions) in order to process them as NVivo document files and use the NVivo's rich text and visual coding features. After completing these conversions all the interview files as well as field note files were transferred into the NVivo Document browser. Figure 3 is the illustration of document browser that shows all the files saved in the document browser. Here, all the project files (observation notes, memo files on demographic features of schools and characteristics of teachers, interview notes, and field notes) as labeled "My diary" can be seen. Figure 3 also lists right hand columns. Some features of these files are their size, nodes linked to these documents, the date documents were created and modified. From the same menu, it is also possible to access different sets (groups of documents) created by the researcher from the left hand column (*sets* are not activated in Figure 3).

Figure 3. All Documents in NVivo.

Observation

Videotapes recorded in the real classrooms for the observation purpose were transformed from visual and verbal expressions to written text after encoding the transcripts. This was one of

the most difficult parts of the data that were analyzed (This is not in the scope of this paper but there are also some computer programs to analyze qualitative visual data such as Transana (a completely free package), Observer, Qualitative Media Analyzer, and vPrism. After completing this research study with a great dissatisfaction with the video portion of data, the author searched for these programs as well. Recently, the traditional programs such as Atlas-ti have new built-in features to analyze visual data just as any other textual data). Sometimes in the video clips, students were not talking but working individually on certain tasks, other times because of the noise in the classroom their voice, were indistinct. Therefore, content of the each video clip was described giving information about what they are doing, the process of accomplishing these tasks, and the informal interviews with the children (They are not transcribed word by word as it is done for in-depth interviews). In Figure 4 examples from classroom observations are presented (these are two different screens next to each other):

Figure 4. Examples of Videotape Descriptions.
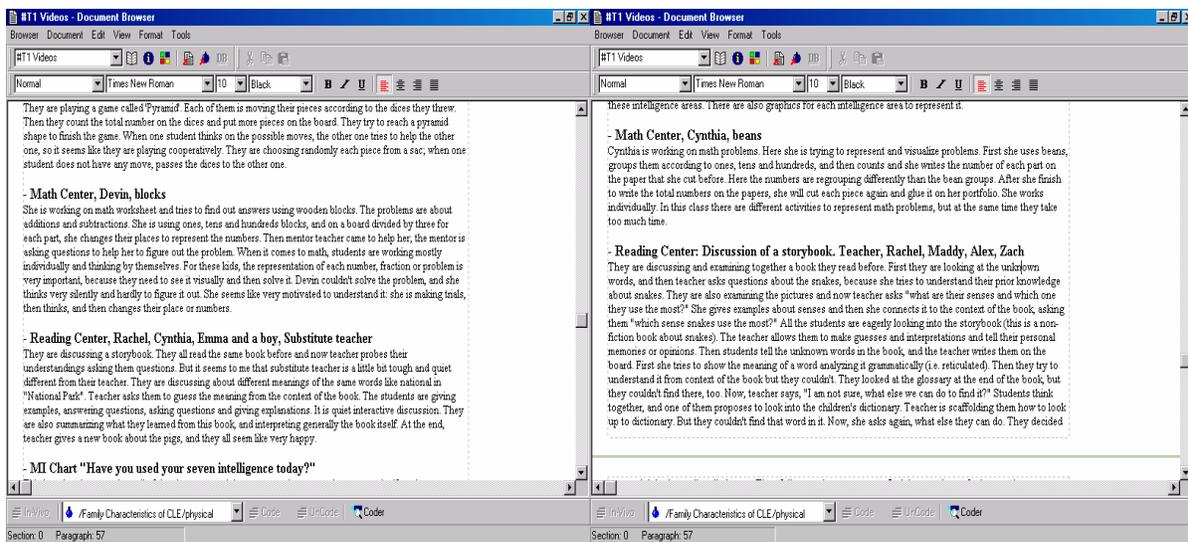
Student Works

Most of the student works were kept in student portfolio folders and files. There were also some pictures of students with a completed class project or an artifact they produced, such as ornaments or wooden tools finished in the construction center, storyboards from literacy center, or lego-logo projects form math center, etc. These pictures were taken to illustrate the work students were working on. The third type of student work is written artifacts such as computer print-outs, poems, or portfolios. The written part of the student works was entered as text files using document browser of NVivo, and ready for coding and further analysis. The others were described in detail by the researcher creating new documents in the document browser. Figure 5 presents two screens that are examples of transformations of student works and memos, respectively (again, these are two different screens to provide more examples for the readers).

*Figure 5.* Example of Extra Documents and Memo Files.
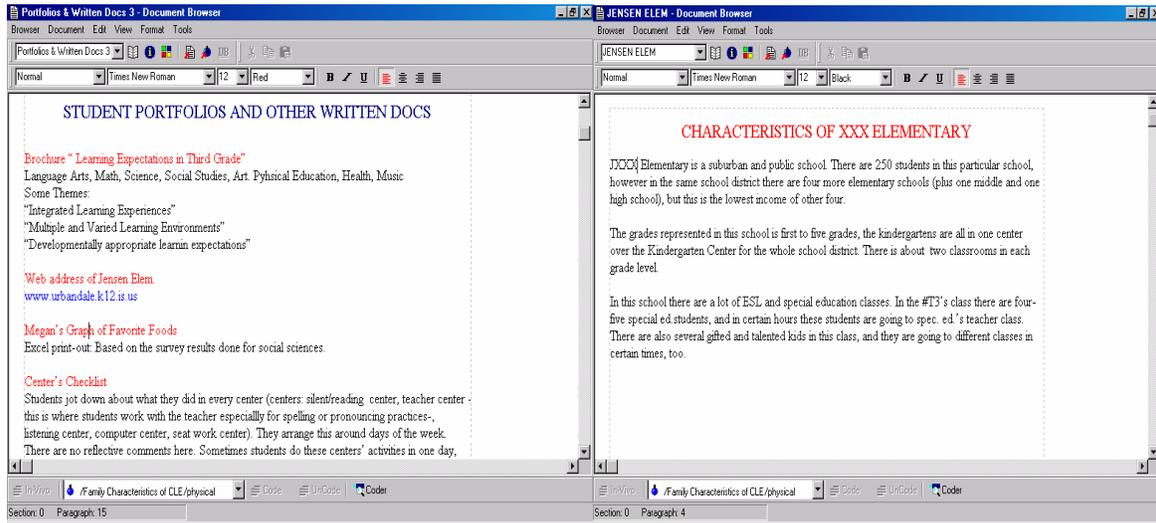
To sum up, the data entry into NVivo requires extensive time and effort. The researchers have to make many decisions to organize their data in NVivo's Document browser and this becomes an important part of the data analysis as well. Unfortunately, this process also requires data reduction at the very early stage of the research study since data collected in the constructivist classroom environments using different media tools are not directly transferred into the software program. One important thing to remember is that NVivo is designed to analyze textual data and it has some features to support different media files but this is not a full support. On the other hand, in order to analyze visual or any other media files in qualitative studies it is almost a necessity to add descriptive textual notes, and one way to avoid over-reduction is to duplicate data and use it in different documents.

Data Analysis

In the data analysis process, the holistic approach was adopted to organize data. In doing so, the data were arranged around five research goals. Later in the study, these questions were reduced into two major research goals and the documents were entered in the pool as their relevance with the research goals rather than breaking them down into pieces/data sources such as teacher interviews, student observations, or field notes. This approach helped a lot to manage the data and eliminate the irrelevant data. Figure 6 shows all the codes and each main code refers to one research goal of the study (This screenshot depicts the five initial research goals). After reading through all the data many times, some patterns emerged and then these patterns were coded under the tree node option (In this study, the researcher did not use an initial coding scheme. Also, coding here does not refer to an atomistic analysis of verbal data). However, at the beginning of this coding process all the nodes were in the free node format since it was not very clear how they fit in the study and what the relations were between them. But, after the data analysis developed, the relationships between the codes became easier to see and the researcher started grouping them using tree codes. In Figure 6, the number of free and case nodes is 0, and the number of free nodes is 50 (left column in the figure.) There are three major sets created but

not shown here. In Figure 6, "Teacher's role in CLE" is highlighted and so there is more information illustrated regarding this code in the gray area. Documents coded to this node is 1, children are 5. This figure also provides a snapshot from an on-going analysis in NVivo.

Figure 6. Main and Sub Codes in the Node Browser.
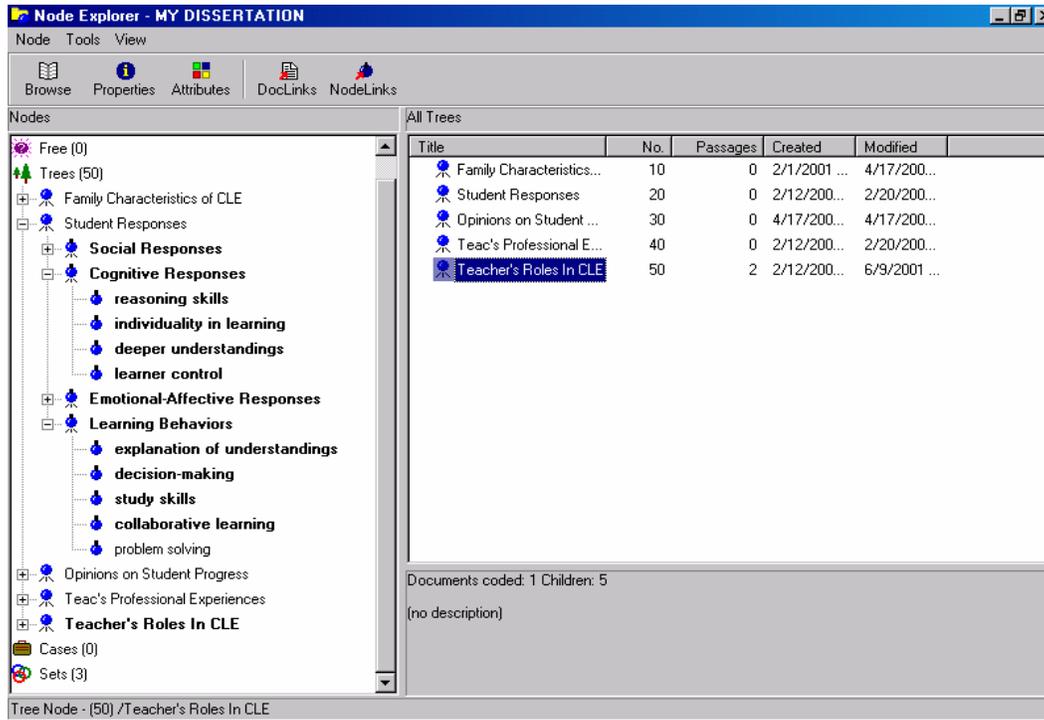
The following illustration in Figure 7 is to exemplify the interview data that are analyzed around some emerged codes (Interviews were the richest part of the data in this study). During the coding process, the phrases, sometimes all paragraph, sometimes a single word, have been highlighted then either the title of a new code typed in the node field area in the bottom or an existed node title was selected, and the enter button pressed. "Speed coding" which is a very helpful coding function becomes a one-second job after qualitative researchers have had some experience using NVivo. Speed coding allows the researcher to change the order of codes, names, types, and descriptions.

Figure 7. Example of Coding in NVivo Using "Coder."
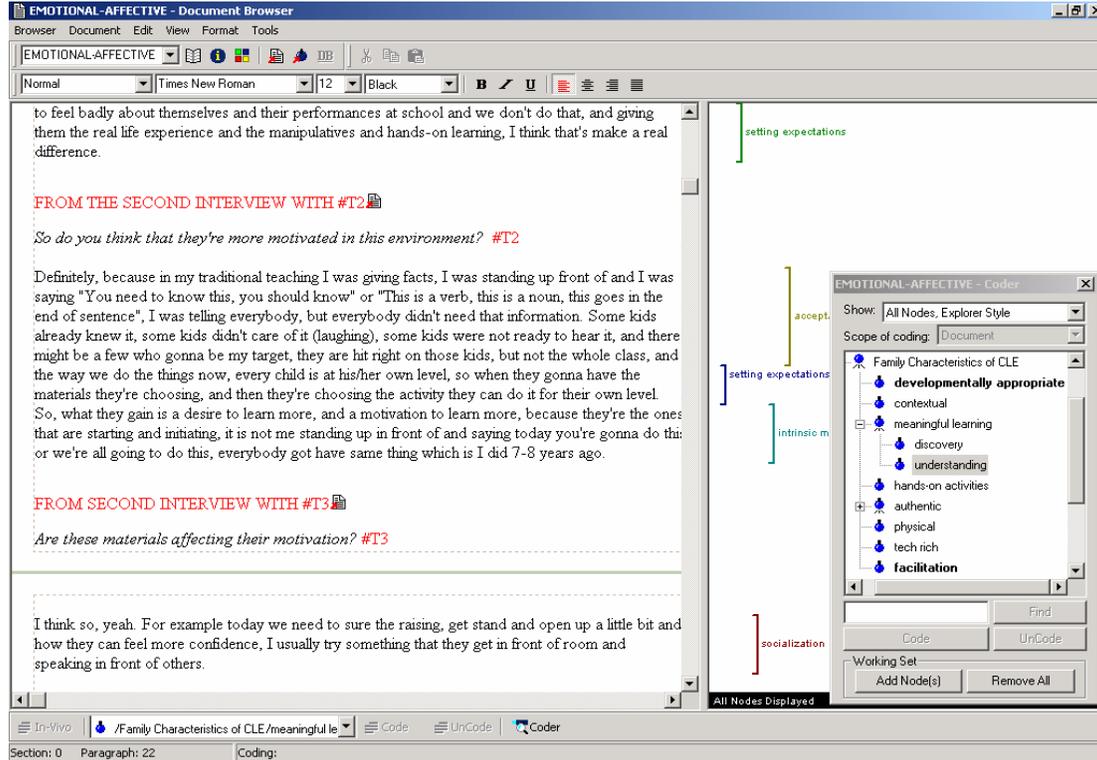
After finishing the coding process, the nodes in the node browser were reviewed to see the patterns that emerged from the study. All the major codes were already grouped as the research goals and in the writing process this was extremely helpful in putting together all the relevant data to draw the conclusions as well as to reshape the codes and present them in an easy to understand and read form.

Write Up

After exploring the codes and organizing them in a meaningful way, the data analysis is not complete. The qualitative data are very fuzzy and classroom environments observed are very complex entities to conceptualize. There are still a lot of overlapping points so the researcher needs to decide in which part of the manuscript those points need to be mentioned. In addition to the overlapping nature of qualitative data, researchers also need to decide which code should be the major category and which one should be a sub-category under this. This also requires understanding and explaining the relationships between different concepts. One example of major codes and sub codes can be seen in Figure 6. The way NVivo groups and helps to manage data are especially useful in writing descriptions of the data. One important caution for the first timers is that NVivo is more useful and helpful if it is understood that in every stage of the data analysis there are many decisions to be made unlike the very clear cut and precise steps of quantitative software packages. However, it is possible to make changes at any time, and play with the data to make better sense of the data.

Summary

In the qualitative research market there are many software packages available for the researchers. It is still possible to use paper and pencil methods and reach meaningful conclusions for very long data sets, however one of the most advanced data analysis packages, NVivo helps tremendously from conceptualization and coding of data to an entire research report saving time and energy of researchers. The drawbacks of using NVivo are not any different than using any other computer program; you may need some time to explore the software and your computer can crash or you can forget to save your work, etc.

Because of the high demand from the researchers the companies that design these programs provide continuous support and updates for the users. Even though NVivo is one of the most popular programs, there are other ones as well worth mentioning here: Atlas/ti, Ethnography, and MaxQD are only some of these programs. These programs have websites and almost all of them provide free downloads for the potential customers. As for the prospective NVivo users, you can go to their website http://www.qsr.com.au to download the software package with its full features. The only difference is that it is not possible to save the data. The researcher strongly recommends novice researchers review these programs before purchasing one.

In conclusion, NVivo is highly suggested by the researcher for use by those who are developing scholarship in the field of qualitative research. As Weitzman (2000, p.803) states:

> making the appropriate match still requires systematic analysis of the needs of the project and the researcher(s), and careful comparison of the software options available at the time of purchase with an eye fixed firmly on those needs. There is still no one best program.

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